

LESSON PLAN

GP Kangra		Department: Instrumentation Engg. Subject: Basic Mechanical Engg.				
		Name of the faculty: Varun				
		Course: Diploma		Duration: 3 Years. Session: March-July 2021		
SYLLABUS COVERAGE		Total Periods: 56 (Theory), 28 (Practical)				
Sr No.	Period Nos	Topic	Details	Instruction Reference	Additional Study Recommended	Remarks
1	6	Introduction	Concept of Engineering mechanics (Applied Mechanics), definition of mechanics, statics, dynamics, application of engineering mechanics in practical fields. Definition of mass and weight, basic quantities and derived quantities, basic units and derived units Concept of rigid body, scalar and vector quantities	Applied Mechanics by Col. Harbhajan Singla, T.L Single & Parmod Kumar Singla		
2	10	Laws of Forces	Definition of force, measurement of force in SI units, its representation, Point force, concentrated force & Uniformly distributed force, characteristics of a force, effects of force Different force systems (coplanar and non-coplanar), principle of transmissibility of forces, law of super-position Composition and resolution of coplanar concurrent forces, resultant force, method of composition of forces, laws of forces, triangle law of forces, polygon law of forces - graphically, analytically, resolution of forces, resolving a force into two rectangular components Equilibrant force and its determination [Simple numerical problems on above topics]	-do-		
3	9	Fluid Mechanics	Properties of Fluids: density, specific gravity, viscosity, compressibility, surface tension, cohesion, adhesion 3.2 Bernoulli's Theorem, Pascal Law and its application, Types of Pressure & units	Introduction to Fluid Mechanics by Cengel		
4	8	Thermodynamic	Boyle's Law, Charles's Law, Joules's Law, Universal Gas Constant, Laws of	Thermodynamics (an		

		s	Thermodynamics (Zeroth Law, First Law and Second Law	introduction), engineering approach by Cengel & boles		
5	8	Pneumatic Systems	Basic Components and function of Air Compressor (Reciprocating & Centrifugal Type) Air Cylinder: Single acting, double acting, piston type, and diaphragm type Air filter regulators and applications of compressed air	Hydraulic and Pneumatics by Andrew Parr		
6	11	Gears & Cams	Toothed gearing spur, bevel, spiral, worm and worm wheels, precision gears, gear trains: simple, compound and reversed gear trains. Backlash in gearing and its elimination. Types and characteristics of cams, followers and cam profiler, and limited cases of specified contours. [Simple numerical problems on the above topics]	Theory of Machine by R.S. Khurmi		
7	4		Revision			

**Govt. Polytechnic Kangra(HP)
Instrumentation Engg.**

**Lesson Plan (Session: April 2021)
Subject:- Control System ; Semester: 4th**

Planned Theory: 16 weeks *5 hours/week= 80 hours, Planned Practical: 32 Hours

Sr No .	Lecture No.	Topic	Detailed Contents	Instruction Reference/ Additional Study Recommended
1	(12) 1-12	Introduction to Control Systems	Introduction, brief classification of control systems: Open loop v/s closed loop, feedback v/s feed forward, linear v/s non-linear, stable v/s unstable, time invariant v/s time variant, causal v/s non-causal (definitions only), representation of electrical, mechanical, electromechanical, thermal, pneumatic, hydraulic systems, force to voltage and force to current analogies.	<i>by Gopal, M Digital Control system</i>
2	(16) 13-28	Transfer function, block diagram algebra and signal flow graph	Concept of transfer function, block diagram algebra: Rules of block diagram reduction and determination of overall transfer function, Signal flow graph: Mason gain formula and its use to determine the overall transfer function, Conversion of block diagram to signal flow graph.	Control System Engineering by Nagrath, I.J. and Gopal M
3	(52) 29-80	Time domain analysis of control systems	Standard test signals: impulse, step, ramp, sinusoidal, impulse response of a control system (from transfer function using inverse Laplace transform), Concept of pole, zero, order and type of a control system, first order , second order systems and their response to impulse and step inputs (for second order systems treat undamped, critically damped, under damped and over damped cases separately), time domain specifications of first order control systems from step response (first five time constants), time domain specifications of second order control systems from step response (natural frequency, damping factor, damped frequency, delay time, rise time, peak time, peak overshoot, settling time	Modern Control Engineering, by Ogata, K.,

			for 2% and 5% settling derivation is expected), static error constants (k_p , k_v , k_a , e_{ss}), dynamic error constants.	
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Sr. No.	Period(2 hours per student/week)	Detail of Practical
1	4hours	Study the circuit and working of the open loop system.
2	4hours	Study the circuit and working of the closed loop system
3	4hours	Find the time response of the first order system.
4	4hours	Find the time response of the second order system.
5	4hours	Study of a temperature system.
6	6hours	Study of a flow system.
7	6hours	Study of a pressure system.

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Lesson Plan (Session: April 2021)

Subject:- Microprocessors and Microcontrollers; Semester: 4th

Planned Theory: 16 weeks *4 hours/week= 64 hours, Planned Practical: 32 Hours

Sr No .	Lecture No.	Topic	Detailed Contents	Instruction Reference/ Additional Study Recommended
1	06 hours (1-06)	Evolution of Microprocessor	Microprocessor, its evolution, function and impact on modern society	Microprocessor architecture programming and applications by B. RAM
2	10 hours (07-16)	2 Architecture of 8085 Microprocessor	Concept of Bus, Bus organization of 8085, functional block diagram of 8085 and function of each block, Pin details and related signals, demultiplexing of address/data bus, generation of Read/Write Control signals, steps to execute and store program.	Microprocessor architecture programming and application by RAMESHA. GAONKER
3	10 hours (17-26)	3. Memories and I/O Interfacing	Memory organization, Concept of memory mapping, partitioning of total memory space, address decoding, concept of I/O mapped I/O and memory mapped I/O. Interfacing of memory mapped I/O devices, concept of Stack and its functions, Basic RAM cell, NXM RAM, Expansion of word length and Capacity, Static and Dynamic RAM, Basic ideas of ROM, PROM, EPROM, EEPROM	Do
4	10 hours (27-36)	Programming of 8085	Brief idea of machine and assembly languages, machine and Mnemonic codes. Addressing modes and Instruction Set Programming of 8085 using 'C	Do
5	12 hours (37-48)	16 Bit Microprocessor (8086)	Salient features of 8086 microprocessor, Architecture of 8086, Register organization, concepts of pipe lining, memory segmentation.	Do
6	10 hours (49-58)	Microcontroller	8051 Architecture, instruction set and programming	Do
7	6 hours	Basic Interfacing Applications	Interfacing Microcontroller, timers, serial port programming, Interrupts LCD,	Do

	(59-64)		Keyboard interfacing, ADC- DAC & Sensor Interfacing, external memory, interface, stepper motor and waveform generation.	
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Sr. No.	Period(2 hours per student/week)	Detail of Practical
1	4hours	Addition of two 8-bit numbers using 8085Microprocessor (using Machine language)
2	4hours	Subtraction of two 8-bit numbers using 8085Microprocessor (using 'C' language)
3	4hours	Multiplication of two 8-bit numbers using 8085Microprocessor (using 'C' language)
4	3hours	Division of two 8-bit numbers using 8085Microprocessor (using Machine language)
5	3hours	To find Largest number in an Array using 8085
6	3hours	To arrange data of an Array in ascending order using 8085
7	5hours	Study of Assembly Language Programming (ALP) using 8086
8	3hours	Stepper motor interfacing using 8051 Microcontroller/PIC Controller
9	3hours	Traffic Light Interface using 8051/PIC

LESSON PLAN

GP Kangra		Department: Instrumentation Engg. Subject: Energy Management				
		Name of the Faculty: Karan Singh Thakur				
Course : Diploma Duration: 3 Yrs. Session: April-June 2021						
SYLLABUS COVERAGE		Total Periods: 80		Theory : 80		
Sr No.	Period Nos	Topic	Details	Instruction Reference	Additional Study Recommended	Remarks
1	1-8 (8)	Definition	Concepts of NCES, Solar, Wind, Geothermal, Biomass, Ocean energy sources, Comparison of these energy sources	Energy Management: W.R.Murphy, G.Mckay	Internet: nptel.ac.in	
2.	9-32 (24)	Solar Energy	Definition, Energy available from Sun, Solar radiation, solar energy conversion into heat, Components of Solar Power System: Solar Panels, Sun Tracking system, Invertor, battery Flat plate and Concentrating collectors, Principle of natural and forced convection, Photo voltaic: pn junctions. Solar cells, PV systems, Standalone, Grid connected solar power system, common faults and maintenance.			
3.	33-44 (12)	Wind Energy	Energy available from wind, Basis of Wind energy conversion, Effect of density, Frequency variances, Angle of attack, Wind speed, Windmill rotors, Horizontal axis and Vertical axis rotors, components and Working of wind power plant, common			

4.	45-52 (8)	Geothermal Energy	<p>faults and maintenance</p> <p>Definition and classification of resources, types, Production, Economics, Environmental effects and Renewability and sustainability</p>			
5.	53-80 (28)	Energy Audit and Management	<p>Definition and Objective of Energy Management, General Principles of Energy Management, Energy Audit: Need, Types, Methodology and Approach. Energy Management Approach, Understanding Energy Costs, Energy performance, matching energy usage to requirements,</p> <p>Maximizing system efficiency, Optimizing the input energy requirements, Fuel and Energy substitution.</p> <p>Procedures and Techniques: Data gathering: Level of responsibilities, control of energy and uses of energy, Evaluation of saving opportunities: Noneconomic factors contributing to energy consumption, Conservation opportunities, estimating cost of implementation. Energy Audit Reporting: The plant energy study report- Importance, contents, effective Organization, report writing and presentation.</p>			

LESSON PLAN

GP Kangra		Department: Instrumentation Engg. Subject: BMED				
		Name of the faculty: Varun Course: Diploma Duration: 3 Years. Session: March-July 2021				
SYLLABUS COVERAGE		Total Periods: 56 , 42(Theory), 14 (Tutorial)				
Sr No.	Period Nos	Topic	Details	Instruction Reference	Additional Study Recommended	Remarks
1	6	Introduction to Management	Definition and concept of Management, Functions of management- planning, organizing, staffing, coordinating and controlling. Various areas of management, Structure of an Organization	Business Studies part-1 of NCERT Text Book		
2	12	Self-Management and Development	Life Long Learning Skills Concept of Personality Development, Ethics and Moral values Concept of Physical Development; Significance of health, hygiene, body gestures Time Management Concept and its importance Intellectual Development: Reading skills, speaking, listening skills, writing skills (Note taking, rough draft, revision, editing and final drafting), Concept of critical Thinking and problem solving (approaches, steps and cases). Psychological Management: stress, emotions, anxiety and techniques to manage these. ICT & Presentation skills; use of IT tools for good and impressive presentations.	Principles & Practice of management by Shyamal Bannerjee		
3	8	Team Management	Concept of Team Dynamics. Team related skills such as; sympathy, empathy, leading, coordination, negotiating and synergy. Managing cultural, social and ethnic diversity. Effective group communication and conversations.	-do-		

			<p>Team building and its various stages like forming, storming, norming, performing and adjourning</p> <p>Leadership, Qualities of a good leader</p> <p>Motivation, Need of Motivation, Maslov's theory of Motivation</p>			
4	4	Project Management	<p>Concept of Management and features</p> <p>Stages of Project Management; initiation, planning, execution, closing and review (through case studies), SWOT analysis concept.</p>	-do-		
5	6	Introduction to Entrepreneurship	<p>Entrepreneurship, Need of entrepreneurship, and its concept, Qualities of a good entrepreneur</p> <p>Business ownerships and its features; sole proprietorship, partnership, joint stock companies, cooperative, private limited, limited, public limited, PPP mode.</p> <p>Types of industries viz, micro, small, medium and large</p>	Entrepreneurship by Lisa A Keister		
6	6	Entrepreneurial Support System (Features and Roles in Brief)	<p>District Industry Centers (DIC's), State Financial Corporation's (SFC's), Small Industries Service Institutes (SISI), Commercial Banks, Micro Financing Institutions, SIDBI, NABARD, National Small Industry Corporations (NSIC), Cooperative Societies, Venture Capitalists, Khadi and Gramodyog Board (H.P.).</p>	-do-		
7	6	Market Study and Opportunity Identification	<p>Types of market study: primary and secondary, product or service identification, assessment of demand and supply, types of survey and important features; qualitative, empirical, schedules, questionnaire,</p>	Marketing Management by Philip Kotler		

8	8	Project Report Preparation	<p>interview.</p> <p>Preliminary Report, Techno-Economic Feasibility Report, Detailed Project Report (DPR) and illustration of these through examples.</p> <p>Exercises on writing project reports of micro and small budgeted projects.</p>	Handbook of small scale industry by P M Bhandari		
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